United Nations Convention on the Law of the Sea CLCS/37

Commission on the Limits of the Continental Shelf

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Outline of the training manual on the Preparation of a Submission to the Commission on the Limits of the Continental Shelf*

1. The Division for Ocean Affairs and the Law of the Sea, in collaboration with Harald Brakke and Galo Carrera, co-coordinators, is in the process of drafting a training manual on the preparation of a submission to the Commission on the Limits of the Continental Shelf under article 76 of and Annex II to the United Nations Convention on the Law of the Sea (UNCLOS). The two coordinators, who are members of the Commission, prepared a master plan for the manual and invited on a widely representative basis, a number of qualified experts from both within and outside the Commission to participate in its preparation. The coordinators themselves have prepared some of the modules.

2. The training manual is designed to assist coastal States, particularly developing States, in the preparation of data and other material concerning the outer limits of the continental shelf in areas where those limits extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. As such, it will be of invaluable assistance in building the capacity of developing coastal States to fulfil their obligations to make submissions to the Commission.

3. The goals of the training manual to be used in the delivery of the course based on the outline prepared by the Commission (CLCS/24), include:

- To enable the technical staff of a coastal State to gain an in-depth understanding of the full procedure that must be followed in order to determine the outer limits of the State's continental shelf beyond 200 M, so that those limits may become final and binding
- To provide an outline of the technical and scientific data that will be required to prepare the submission
- To raise the awareness of technical and other staff of a coastal State of how different fields of expertise will have to be called upon in order to satisfy the

* Submission of the document was delayed owing to consultations needed with the Chairman of the Editorial Committee of the Commission and other members of the Commission.

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technical and scientific requirements of article 76 of UNCLOS and of the Scientific and Technical Guidelines of the Commission (CLCS/11 and Add.1)

- To train the technical staff of the coastal State through practical exercises in preparing a submission on the outer limits of the continental shelf

4. The insight gained by the State's technical staff through such a course will hopefully enable the national Government:

- To assess the complexity and cost of its own case in the light of its time limit for making a submission to the Commission
- To decide on the institutional framework within the State to organize and prepare its submission to the Commission
- To assess how much of the submission may be prepared by its own staff and how much additional expertise and know-how, if any, it may still need to import

5. The training manual under preparation by the Division for Ocean Affairs and the Law of the Sea is based on the outline for a five-day training course for delineation of the outer limits of the continental shelf beyond 200 nautical miles and for preparation of a submission of a coastal State to the Commission on the Limits of the Continental Shelf, which was adopted by the Commission at its eighth session on 1 September 2000 (CLCS/24).

6. The training manual is an integral document based on the Scientific and Technical Guidelines of the Commission. It comprises an introduction and thirty modules, which incorporate both lectures and practical laboratories.

The *introduction* to the training manual provides information about the origin, framework and objectives of the manual.

Module 1: Introduction to article 76 (Part I) contains a review of the origin and evolution of the legal regime of the continental shelf in international law. It describes the legal status of the continental shelf and the rights and obligations of States according to UNCLOS. It contains a brief introduction to scientific concepts of the continental margin with its shelf, slope and rise.

Module 2: Introduction to article 76 (Part II) provides a commentary to article 76, paragraphs 1 to 3. It describes the fundamental features which must be identified in order to implement article 76, such as the foot of the continental slope and the four rules and their application. It describes the consequences in terms of the Convention resulting from the categorization of various types of seafloor highs. It provides a commentary on article 76, paragraphs 4 to 10, and a description of the test of appurtenance.

Module 3: Introduction to the Scientific and Technical Guidelines of the CLCS presents the purpose and summarizes the contents of the Scientific and Technical Guidelines of the Commission. It includes a description and an elaboration of the geodetic, geological, geophysical and hydrographic methodologies stipulated in article 76 for the establishment of the outer limit of the continental shelf, using such criteria as determination of the foot of the continental slope, sediment thickness and types of seafloor highs.

Module 4: Modus Operandi of the Commission, describes the flow of internal procedures followed by the Commission and its subcommissions during the consideration of a submission and the preparation of the recommendations of the subcommission to the Commission and the Commission to the State. It describes the actions that may be taken by the coastal State following the recommendations of the Commission.

Module 5:Data requirements of a submission to the Commission describes the structures of a submission to the Commission and the kinds of geodetic, geological, geophysical and hydrographic data and information that may support it.

Module 6: Delineation demonstration is a practical laboratory exercise designed to demonstrate the application of the four rules contemplated in article 76. It is a hands-on exercise to ensure a full understanding of the general principles of article 76.

Module 7: Geodetic methodologies I contains definitions of units, reference systems and coordinate transformations. It describes sources of data and positioning methodologies and emphasizes the need for error estimation.

Module 8: Geodetic methodologies II provides a geodetic definition of baselines. It shows the two methodologies employed in the determination of distances in article 76: envelope of arcs and *tracés paralleles techniques* with their confidence zones.

Module 9: Hydrographic methodologies I describes sources of data. It reviews hydrographic echo-sounding methodologies such as single-, multi-beam echo sounding, interferometric sonar measurements and seismic-derived bathymetry.

Module 10: Hydrographic methodologies II reviews the concept of the low-water line and tidal datum transfer. It describes chart compilation and nautical cartography. It shows the wide range of contouring techniques and the delineation of the 2,500m isobath in particular. It also describes the fractal properties of isobaths and coastlines.

Module 11: Geodetic and hydrographic laboratory is a practical laboratory exercise designed to determine various geodetic and hydrographic-derived outer limits and their error assessments. It includes topics relating to contouring and the determination of confidence regions.

Module 12: Maximum change in the gradient I describes sources of data. It presents a review of two-dimensional and three-dimensional digital bathymetric models and their error estimates.

Module 13: Maximum change in the gradient II defines filtering and smoothing of bathymetric profiles and surfaces. It presents a review of various methodologies and the advantages and disadvantages of their application.

Module 14: Maximum change in the gradient III defines high-order analytic and numerical derivatives. It shows the nature and value of two- and three-dimensional estimations of the foot of the continental slope and their error estimation.

Module 15: Evidence to the contrary to the general rule I describes the scientific classification of the continental margins of the world into three major classes: convergent, divergent and sheared margins. In more detail, it describes three types of convergent margins: accretionary, poor or non-accretionary, and destructive.

Module 16: Evidence to the contrary to the general rule II describes more details of the sheared margins and the divergent margins, including the rifted non-volcanic and rifted volcanic margins. It presents a commentary on article 76, paragraph 4 (b), and presents geological and geophysical evidence relevant to the problem of evidence to the contrary to the general rule regarding the establishment of the foot of the continental slope. The descriptions of the different types of continental margin contained in modules 15 and 16 are made with a view to be of relevance also to modules 19 and 27.

Module 17: Evidence to the contrary to the general rule III discusses the determination of the foot of the continental slope from evidence to the contrary to the general rule at the different types of convergent, divergent and sheared margins. It also contains a review of the type of consideration and discussion of evidence provided in support in any given case.

Module 18: Foot of the continental slope laboratory contains a summary of principles in the form of a practical exercise to determine the foot of the continental slope by both maximum change in gradient and evidence to the contrary to the general rule.

Module 19: Sediment thickness I presents a formulation of the problem with a brief introduction to sedimentary processes and the sedimentology of continental margins. It provides a definition of sediment thickness and basic requirements. It describes relevant geophysical techniques and information, such as seismic reflection and refraction, and gravity and magnetic data. It highlights the role of data interpretation and mapping and discusses the question of minimum data coverage.

Module 20: Sediment thickness II illustrates the process by means of which depth conversion and sediment thickness is attained. It reviews seismic velocity with its theory and applications, depth conversion of seismic data and the inversion of gravity and magnetic data. It also shows an optimal selection of the outermost fixed 1-per-cent points.

Module 21: Sediment thickness III includes analyses of error estimates relating to sediment distribution versus relief of seabed and acoustic basement surfaces. It discusses an analysis of data accuracy, computation of range of error and the transformation to a map.

Module 22: Project planning I discusses the need and procedure to assemble all existing available data. It discusses the potential identification of the need for new data, and different data types. It proposes a methodology for survey planning.

Module 23: Project planning II provides an analysis of service demands, data acquisition and processing. It discusses the procedures for an analysis of in-house equipment and training, the tendering process, and project management and monitoring.

Module 24: Sediment thickness laboratory is a practical exercise to review the entire sediment thickness formula, including planning for optimal acquisition of new data for sediment thickness determination and the selection of outermost fixed points. It includes seismic interpretation and the definition of basement, depth conversion on profiles and an analysis of their uncertainties and inaccuracies. It continues with the determination of the sediment thickness formula line and its confidence region based on an analysis of profiles and calculations.

Module 25: National desktop study I illustrates how to research and compile existing available data. It discusses the preparation of base maps such as bathymetric, preliminary foot of the continental slope, 2,500m isobath and sediment thickness.

Module 26: National desktop study II illustrates the procedure for identifying if and when there is a need for new data, and data types. When such a need is identified, it illustrates the procedure to determine cost estimates and the preparation of recommendations to the State.

Module 27: Sea floor highs is a commentary on article 76, paragraphs 3 and 6. It reviews the types of seafloor highs. It describes the effects according to article 76 of characterizing seafloor highs as submarine elevations, submarine ridges and oceanic ridges.

Module 28: Delineation of the outer limits is a commentary on article 76, paragraphs 4, 5 and 7. It describes the formulae line and the constraints line. It discusses the methodology for delineating lines of maximum 60M length, which define the outer limit of the continental shelf.

Module 29: Submission outline presents the procedural flow that a State may undertake from its initial questions and response to its entitlement to and determination of the outer limits of a continental shelf beyond 200 nautical miles. It presents a national desktop study as a strategic plan of action with its scientific and technical data compilation. It describes the role of the Commission in assisting coastal States. It emphasizes the need to perform a cost/benefit analysis.

Module 30: Preparation of the submission takes the end of the desktop study as the starting point towards the preparation of a submission. It emphasizes the advantages of a well-designed desktop study as the first step in the preparation of a submission to the Commission. It highlights the advantage of a structure based on an executive summary, main body, and supporting data.

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